

UE20CS151 Project Proposal

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Aim

The aim of this project is to implement a simple, persistent database management system. The system will be able to handle a minimal subset of SQL (limited to a single table, `INSERT` and `SELECT`), and data will be persisted onto disk.

The Planning and Design on this database will mostly be inspired by SQLite, given the wealth of documentation / implementation available on said implementation.

This project will be implemented entirely in C, and version control (along with a Github Repository) will be used to keep track of all the work.

Learning Outcome

The implementation of this project will include (but will not be limited to) learning the following concepts -

1. Dynamic Memory Allocation / re-allocation (using `valgrind` to check for memory leaks)
2. Structures and Pointers
3. Minimal SQL parser and tokenizer implementation
4. Serializing/Deserializing Data Structures to bytes
5. Writing/reading serialized data to/from disk
6. BTrees/B+ Trees and implementation
7. Prospective : Multithreading to ensure concurrent access
8. Prospective : Network Interfaces using raw Berkely Sockets to support non-local query execution
9. Unit Testing built binaries using `python3` and `subprocess`